

1 TRANSPORTER FOR VERTICAL MOVEMENT AND LATERAL TRANSFER
2 OF PERSONS HAVING IMPAIRED OR NO SELF-LOCOMOTION
3 Specification

4 Field of the Invention

5 A transporter for raising and lowering persons having
6 impaired or no self-locomotion, and enabling their lateral
7 transfer such as between a wheelchair or bed, an examination
8 table, or an X-ray table.

9 Background of the Invention

10 Persons having impaired or no self-locomotion face many
11 difficulties and impediments to receiving adequate medical and
12 custodial care. Examples are persons with spinal injuries that
13 deprive them of the use of their legs. In addition to these
14 widely-recognized causes, there are many others, such as the
15 gradual loss of power to the extremities of persons with multiple
16 sclerosis. Persons dependent on walkers, or those with
17 insufficient voluntary control such as Alzheimer patients may
18 still have some control, but so little as to render them
19 incapable of substantial voluntary movement needed to place
20 themselves in some desired but inconvenient location.

21 The fact that there are so many such causes and so many
22 involved persons is attested by the large number of wheel chairs
23 and assistance devices which are sold each year. Persons not
24 encumbered by these disadvantages may readily conclude from their

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Donald D. Mon _____ Reg. No. 18,235

Donald D. Mon

1 own observations that the problems are largely those of passing
2 through portals, fitting into restrooms, and getting onto and off
3 of public conveyances. These are certainly real, and are known
4 principally because they are so much in the face of mobile people
5 who use or occupy the same spaces and facilities. As serious as
6 these are, they represent the more hopeful side of the situation,
7 because they are seen and have attracted solutions.

8 There is, however, a sadder and quieter side that, because
9 it occurs out of sight and much less frequently, is looked past.
10 These are not totally ignored, but they are not widely seen, and
11 they are not public enough to cause a public outcry. And what is
12 worse, the help that can be given by others societally and
13 personally is inherently limited, and the cost of amelioration
14 with the use of presently-known equipment is too high for many or
15 most individuals to afford.

16 This invention relates to such a "niche" in the world of
17 persons with impaired or no capacity to move themselves
18 sufficiently. Persons whose limbs cannot respond forcefully to
19 commands are known to be inherently exposed to harm from falls.
20 It is less recognized that even greater harm can result from the
21 handling of these people who have fallen. After a fall, a 911
22 call will bring a helpful, muscular group of fine men who can
23 readily lift the weight of the person, but who can just as
24 readily break their ribs while they carefully squeeze and lift

1 the person.

2 Less stressful occasions are nearly as harmful, for example
3 when custodial people lift a fallen person, or transfer one from
4 a bed to a chair. Here both persons are placed at risk. Often
5 it requires two or more people to do this task, which is
6 inherently clumsy. As a consequence a large number of accidents
7 occur, not only to the person, but to those lifting the person.
8 As a consequence workers compensation insurance rates are very
9 high, and often employees will refuse to lift or transfer an
10 impaired person except when absolutely necessary, and at least
11 risk to themselves. Accordingly, they minimize handlings such as
12 transfer from bed to chair, especially when a lift is needed,
13 along with a lateral movement.

14 There is a set of situations which occur quietly, out of
15 general sight, and usually in private which are not urgent, but
16 which in the long run may result in even greater discomfort and
17 ultimate damage. Surprisingly, these occur in the unlikeliest of
18 places- where succor would most be expected- for example in care
19 facilities, especially hospitals and doctors offices.

20 Here, when a patient arrives in a wheelchair there are no
21 more than the usual objections or problems in receiving the
22 person being wheeled in, while the person remains in the
23 wheelchair. No problem in the waiting room, and no problem for
24 conversational and superficial examinations, nor of routine

1 testings, such as blood withdrawal.

2 Instead, the principal, but not the only, situation attended
3 to by this invention arises from the need to examine the body and
4 the insides of an impaired person. For this, one must recognize
5 that square footage in hospitals and doctors offices is scarce
6 and costly. A doctor requires several examination rooms so that
7 he can attend to the needs of several patients in an economical
8 time frame. These rooms need contain only an examination table
9 and enough room for him to move around in it.

10 An X-ray room needs only space for the equipment and space
11 at one side to load and unload the patient on the table. Any
12 more is wasteful and unnecessary.

13 In normal practice, an ambulatory person walks or is wheeled
14 into any of the above rooms and stretches out on the table. No
15 problem there. But if that person is not fully responsive and
16 capable of assistance or self-locomotion, he or she must somehow
17 be lifted onto the table with all of the risks discussed above
18 which involve lifting the person onto the table, then the
19 situation is entirely different.

20 The hospital or the doctor must now factor into the
21 situation all of the costs and risks to place that person in a
22 location where the task can be done correctly. This can be done
23 if all parties take the above risks. Instead, it is surprisingly
24 customary for many internal examinations and even X-rays to be

1 taken while the patient remains in the wheelchair. There are
2 women who have never had a complete gynological examination, or a
3 pap smear or a mammogram because they were examined in the
4 wheelchair- never while on a proper examination table or device
5 where they could properly be viewed.

6 Too often even routine examinations, regularly given to
7 others, are not performed at all. The insufficiency of these
8 procedures has recently been called into question, because they
9 clearly reflect the giving of services to a degree to disabled
10 persons far below that attainable with the same equipment
11 provided that a person is properly positioned on it. Statutes
12 exist, such as California's Unruh act, which proscribe such
13 situations, but they remain commonplace in the absence of some
14 realistic solution.

15 It is unfair to cite the hospitals and doctors for this.
16 Their workers compensation insurance rates and office rents are
17 far higher than for most comparable services. Existing equipment
18 that could assist is bulky and very expensive. For example,
19 examination tables and X-rays tables do exist that raise and
20 lower. These are much more costly than those which do not. How
21 can the individual doctor afford these? And must he provide
22 these when so few, if any, of his patients would require them?
23 Economics say no. So except for large clinics, specialized
24 equipment for the transport of physically impaired people is

1 simply not provided, and patients receive less care than if they
2 could safely be placed on a proper surface, or if the doctor
3 risks harming them while attempting to help them.

4 While silent and private, such situations are not the less
5 saddening or frightening to the involved person. But because
6 they are so private, they have called for no public solution, and
7 are unlikely to obtain one societally. Accordingly, it becomes
8 the task of concerned inventors and companies to provide an
9 acceptable, affordable, and above all, a dignified means to
10 attend to them.

11 It is an object of this invention to provide a small,
12 portable, inexpensive device to receive a person laterally
13 without raising or lowering him or her, and then to raise or
14 lower him or her to a desired elevation, and then facilitate the
15 lateral movement of the person to a next surface, such as to an
16 examination table, an X-ray table or a chair. All vertical
17 movement is powered, and all lateral movement is done without
18 vertical movement of the person, only a sliding movement that can
19 readily be safely attended to. It is well-recognized that it is
20 much more difficult to raise a person than to move him or her
21 side wise, or to lower the person. The transport provided by
22 this invention will be safe for all involved persons.

23 Brief Description of the Invention

24 Apparatus according to this invention includes a mobile

1 base, a cap with a smooth top surface, and a jack between the
2 base and the cap. The cap depends downwardly in the manner of an
3 inverted cup over the upper part of the base. The base carries
4 guides along which the cap slides as it moves vertically when the
5 jack is actuated. The sidewall of the cap surrounds the upper
6 part of the base without pinch points that could catch and injure
7 the hands.

8 According to a preferred but optional feature of the
9 invention, a stabilizer is provided to stabilize the position of
10 a person on the top surface so he or she will not slide off.
11 Such a stabilizer may be a belt, a removable rail, or some other
12 type of restraint removably attachable to the cap.

13 The above and other features of this invention will be fully
14 understood from the following detailed description and the
15 accompanying drawings, in which:

16 Brief Description of the Drawings

17 Fig. 1 is a perspective view of the invention in a lowered
18 position;

19 Fig. 2 is a similar view with the transporter in an elevated
20 position;

21 Fig. 3 is a detail view of a portion of the invention; and

22 Fig. 4 is a cross-section taken at line 4-4 in Fig. 1.

23 Detailed Description of the Invention

24 A transporter 10 according to this invention is shown in

1 Fig. 1. Its purpose is to receive a person from a table, gurney,
2 wheelchair, walker, or other structure, raise or lower him or her
3 to the elevation of a next surface, and facilitate the movement
4 of the person to a next surface.

5 The transporter includes a base 11 which is made mobile by
6 casters or wheels 12 on which it rests. These may be steerable
7 or universally freely turnable as desired so as, readily to be
8 movable around the room. Any suitable type of brake or restraint
9 may be provided to lock the base against movement when
10 appropriate.

11 Base 11 includes a central platform 13 which supports
12 vertical guides 14. It also supports a jack 15, which may for
13 example be a screw type, or even a hydraulic piston-cylinder
14 type. A screw type will be preferred. It is readily powered by
15 a bi-directional motor 16 that receives power from a source of
16 electricity such as a battery 17.

17 To minimize the bulk of the transport, the jack is mounted
18 to the base by a U-shaped mounting bracket 18 that places the
19 base of the jack as close to the floor as possible.

20 A bi-directional and off-on switch 19 determines the
21 direction of operation of the jack by determining which direction
22 the motor is to turn. It also includes a "stop" position. The
23 jack will preferably be self-locking so that a weight on it will
24 not cause movement of the jack. Only operation of the motor will

1 cause the jack to move. If the jack is a screw type, a screw
2 with a locking angle will be used. Otherwise a brake will be
3 provided.

4 A cap 20 includes a support 21 with a top surface 22 which
5 extends beyond the guides. It has a sidewall 23 that depends
6 downwardly from the support. The base preferably includes
7 sidewall 24 that rises inside sidewall 23 in a telescopic manner.
8 The cap therefore depends downwardly, much as an inverted cup.
9 The sidewalls enclose all moving parts, and are closely fitted so
10 as to exclude fingers, forming no pinch regions.

11 Top surface 22 is planar, and preferably is quite smooth.
12 Smoothness enables a person to slide (or to be slid) along this
13 surface, so that the weight of the person need not be lifted.
14 Lateral movement of a person is a simple matter, requiring at
15 most some modest support while the person moves from some next
16 surface at the same elevation.

17 It will be prudent, although not essential, to provide a
18 stabilizer to hold the person on the top surface while the
19 transporter is being moved with the person atop it. A separable
20 belt 27 attached to the transporter may be adequate.

21 However, a more robust and versatile stabilizer may be
22 preferred which offers lateral support. For this purpose,
23 sockets 30 may be formed in support 21. Stakes 31 may be
24 inserted in these sockets with a portion 32 projecting above the

1 top surface. A collar 33 on the stake will limit its insertion
2 into the socket. A web 34 may be stretched between adjacent
3 stakes to provide a gentle restraint, and may even form a
4 backrest against which the person can lean.

5 Usually the person's legs will hang over the edge of the
6 support. A sitting position then may be preferred. The legs are
7 readily lifted when the person is to be moved without much
8 effort.

9 It will be noted that this is not a large cumbersome piece
10 of furniture. A top surface about 30 inches square will usually
11 be more than ample. Surfaces as small as 17 inches by 22 inches
12 will fill many needs. The range of elevations above floor will
13 ordinarily be between about 20 and 32 inches. Only a range of
14 about 12 inches for elevation change is usually sufficient,
15 although it can be more or less.

16 This device can be moved from room to room, can pass through
17 standard doorways, and can fit in available spaces in small
18 existing rooms. It can be finished as an attractive piece of
19 furniture, or made of metal and plastic as desired.

20 As an additional assurance to the transported person, a
21 depending lip 40 (shown only in Fig. 1) may be formed at two
22 opposite edges of the top surface. The person is thereby given a
23 means to hold on to the transporter with his or her hands.

24 This device thereby enables the transport of persons from

1 one structure to another, with accompanying changes of elevation
2 made without physical effort. It makes available to this group
3 of people facilities for examination and treatment now denied to
4 them.

5 This invention is not to be limited by the embodiment shown
6 in the drawings and described in the description, which is given
7 by way of example and not of limitation, but only in accordance
8 with the scope of the appended claims.